Name: Date:

Polynomial Factoring solution (version 637)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 4x + 22 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(22)}}{2(1)}$$

$$x = \frac{-(-4) \pm \sqrt{16 - 88}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{-72}}{2}$$

$$x = \frac{4 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{4 \pm 6\sqrt{2}\, i}{2}$$

$$x = 2 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-6 + 5i$ and $2 + 3i$ in standard form $(a + bi)$.**

Solution

$$(-6 + 5i) \cdot (2 + 3i)$$

$$-12 - 18i + 10i + 15i^2$$

$$-12 - 18i + 10i - 15$$

$$-12 - 15 - 18i + 10i$$

$$-27 - 8i$$

Polynomial Factoring solution (version 637)

3. **Write function $f(x) = x^3 + 12x^2 + 44x + 48$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	12	44	48
-6		-6	-36	-48
	1	6	8	0

$$f(x) = (x + 6)(x^2 + 6x + 8)$$

$$f(x) = (x + 6)(x + 4)(x + 2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 7)^2 \cdot (x + 3)^2 \cdot (x - 2) \cdot (x - 6)^2$$

Sketch a graph of polynomial $y = p(x)$.